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# Course: Oil and Gas Processing Flow Measurement

| Code | City            | Hotel         | Start      | End        | Price  | Language - Hours |
|------|-----------------|---------------|------------|------------|--------|------------------|
| 127  | Warsaw (Poland) | Hotel Meeting | 2025-01-13 | 2025-01-17 | 5450 € | En - 25          |

## INTRODUCTION

Accurate flow measurement is essential to today`s oil & gas operations. Our Fiscal Metering Training Seminar aims to provide training to facility operators, technicians and engineers, which, once delivered, "keep on working".

Delegates are encouraged to raise queries both during and at any time after attending the seminar. Delegates are also encouraged to bring with them any issues that they may have to the seminar.

High quality multi-media is used to supplement traditional methods throughout the presentation, (based on our Interactive Training Software) which has proven to be more useful in explaining and understanding the topic than actually seeing a system in operation.

## SEMINAR OBJECTIVES

- Understanding the Legal and Commercial Metering Requirements
- Appreciate design criteria and importance of accuracy
- Understand measurement concepts and types of error
- Understand the basic concepts, principle of operation and equipment used for Gas metering, liquid metering, proving and sampling
- Understood the basic concepts, principle of operation and hardware used for typical flow computers, Prover Control Micro-computers and Supervisory Systems.
- Understand the typical operations, control functions and record keeping requirements



- Evaluate the results of Turbine Meter Calibration and determine the validity by use of Control Chart

## **SEMINAR OUTLINE**

### **TYPICAL GAS SYSTEM OVERVIEW**

- Typical Gas Pipeline System
- Role of Operator
- Overview of Typical Gas Sales
- Contracts

### **TYPICAL GAS METERING SYSTEM OVERVIEW**

- Introduction to Fiscal Metering
- Pipework and Valving
- Flow Measurement
- Secondary Instrumentation

### **PRIMARY FLOW MEASUREMENT INSTRUMENTATION**

- The Flowmeter
- Meter Tubes and Other Fittings
- Removals/Replacement Procedure

### **FLOW MEASUREMENT ACCURACY**

- Flow Measurement Uncertainty,
- Rangeability and Calibration
- Calculating Uncertainty
- Traceability



## **SECONDARY MEASUREMENT INSTRUMENTATION**

- Pressure Measurement
- Temperature Measurement
- Density Measurement

## **GAS QUALITY MEASUREMENT**

- The Gas Sampling and Conditioning System
- Relative Density Analyser
- Moisture Analyser

## **GAS CHROMATOGRAPHS**

- Introduction to Gas Chromatography
- Gas Conditioning System
- Gas Chromatograph
- Chromatograph Controller
- Calibration and Maintenance

## **COMPUTER SYSTEM OVERVIEW**

- Hardware
- Software
- Display Formats
- Alarm Handling and Interpretations
- Response to Input Failures

## **SUPERVISORY COMPUTER SYSTEM**

- Hardware and Software
- Operator Interface
- System Security



- Communications

## **METERING PANEL AUXILIARY EQUIPMENT**

- Analogue to Digital Conversion
- Power Supplies

## **INTRODUCTION TO PRIMARY FLOW MEASUREMENT DEVICES**

- Introduction
- Basic Principles of Pipe Flow
- Mathematical Developments

## **PRIMARY FLOW MEASUREMENT DEVICES - Differential Pressure Type**

- Simple Theory
- Orifice Meters
- Venturi Meters
- Flow Nozzles
- Low Loss Devices
- Variable Orifice Meters
- Variable Area Meters
- Pitot Tubes and Pitot Static Tubes
- Target Flowmeters

## **PRIMARY FLOW MEASUREMENT DEVICES - Displacement Flowmeters**

- Basic Principles
- Liquid Meters
- Designs for Gases
- Advantages and Disadvantages
- Applications



## **PRIMARY FLOW MEASUREMENT DEVICES - Rotary Inferential Meters**

- Turbine Flowmeters
- Miscellaneous Designs
- Advantages and Disadvantages

## **PRIMARY FLOW MEASUREMENT DEVICES - Fluid Oscillatory Flowmeters**

- Principle of Operation
- Vortex Shedders
- Advantages and Disadvantages

## **PRIMARY FLOW MEASUREMENT DEVICES - Electromagnetic Flowmeters**

- Principle of Operation
- AC and Pulsed DC Types
- Applications
- Advantages and Disadvantages

## **PRIMARY FLOW MEASUREMENT DEVICES - Ultrasonic Flowmeters**

- Doppler Type
- Time-of -Flight Type
- Clamp-on Type
- Applications
- Advantages and Disadvantages

## **PRIMARY FLOW MEASUREMENT DEVICES - Mass Flow Measurement**

- Coriolis Flowmeters
- Angular Momentum Devices
- Thermal Meters
- Applications



- Advantages and Disadvantages

## **PRIMARY FLOW MEASUREMENT DEVICES - Miscellaneous**

- Cross Correlation
- Tracer Methods
- Weighing Methods
- Lasers



**The Scandinavian Academy for Training and Development employs modern methods in training and skills development, enhancing the efficiency of human resource development. We follow these practices:**

• **Theoretical Lectures:**

- We deliver knowledge through advanced presentations such as PowerPoint and visual materials, including videos and short films.

• **Scientific Assessment:**

- We evaluate trainees skills before and after the course to ensure their progress.

• **Brainstorming and Interaction:**

- We encourage active participation through brainstorming sessions and applying concepts through role play.

• **Practical Cases:**

- We provide practical cases that align with the scientific content and the participants specific needs.

• **Examinations:**

- Tests are conducted at the end of the program to assess knowledge retention.

• **Educational Materials:**

- We provide both printed and digital scientific and practical materials to participants.

• **Attendance and Final Result Reports:**

- We prepare detailed attendance reports for participants and offer a comprehensive program evaluation.

• **Professionals and Experts:**

- The programs scientific content is prepared by the best professors and trainers in various fields.

• **Professional Completion Certificate:**

- Participants receive a professional completion certificate issued by the Scandinavian Academy for Training and Development in the Kingdom of Sweden, with the option for international authentication.

• **Program Timings:**

- Training programs are held from 10:00 AM to 2:00 PM and include coffee break sessions during lectures.